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The Results of the 2003 *Guide to Eating Ontario Sport Fish* Questionnaire

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THE RESULTS OF THE 2003

GUIDE TO EATING ONTARIO SPORT FISH

QUESTIONNAIRE

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SUMMARY

This report presents the results of a questionnaire distributed with the 2003 *Guide to Eating Ontario Sport Fish*, and compares the findings to the results in previous questionnaires. A total of 251 responses to the 2003 questionnaire were received and used in the analysis found in this report.

Highlights of the results are:

1. Almost 70% of the respondents fished at least once every two weeks.

2. The water body most frequently fished by respondents was Lake Ontario, while Lake Simcoe was the most popular inland lake and the Grand River was the most popular river.

3. Walleye was the most frequently caught and consumed sport fish, with over 67% of the respondents consuming it.

4. The size of the average sport fish meal consumed by respondents was 236 grams (8.3 ounces) and the most common consumption frequency was several times per year.

5. The average meal size for commercially purchased fish was 211 grams (7.4 ounces) and the most common consumption frequency was 1 to 4 times per month. Most commercially purchased fish were saltwater fish.

6. Over 76% of the respondents in the 2003 survey had used the *Guide* in previous years.

7. Almost 80% of the respondents checked the *Guide* consumption advice before consuming their catch.

8. Over 66% of the respondents indicated that their fishing and/or fish-consuming habits had changed after using the *Guide*.

9. Almost 85% of the respondents found that the information in the *Guide* met their needs.

As well as answering the questions in the survey, many of the respondents also provided comments on the *Guide*, of which many were favourable. The entire set of verbatim comments from the respondents to this 2003 questionnaire is provided in Appendix III.

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1.0 INTRODUCTION

The Ontario Government began monitoring contaminant levels in sport fish in the 1960s when concerns were first raised about the effects of substances such as dichlorodiphenyltrichloroethane (DDT) on aquatic life.

At that time, the Province of Ontario became aware of mercury contamination due to discharges from chlorine production plants. These sources were either eliminated or severely curtailed in the early 1970s and intensive fish monitoring programs were initiated at affected sites.

During the 1970s, studies of contaminants in Ontario sport fish were expanded to include such substances as PCBs, mirex, organochlorine pesticides and other organic chemicals.

These efforts led to the formation of the Sport Fish Contaminant Monitoring Program (SFCMP), designed to test fish from as many angling areas as possible and assess all statistically reliable data on contaminants in Ontario sport fish. The program is a coordinated undertaking of the Ontario Ministries of Environment (MOE) and Natural Resources (MNR). Advice on human health protection is provided by specialists in Health Canada (HC).

Sport fish are collected mainly by the MNR, however, the SFCMP does collect sport fish from those areas that the MNR is unable to sample. The fish are analyzed by the MOE laboratory in Toronto. The test results are interpreted by SFCMP staff from the MOE and consumption advice is provided for various size ranges of each species tested. The advice is based on Tolerable Daily Intake (TDI) information derived through research and review of toxicological data and provided by HC. The advice is incorporated into the biennially updated "*Guide to Eating Ontario Sport Fish*" which gives consumption advice on fish species from over 1700 of Ontario's inland lakes, rivers and Great Lakes locations.

2.0 HISTORY OF THE *GUIDE* QUESTIONNAIRES

There have been eight sets of questionnaires associated with the *Guide*. In 1978, the first year of the *Guide*, questionnaires were sent randomly to people who had requested a copy of the *Guide* from MOE staff in response to newspaper advertising[1]. A total of 876 replies were received. In 1983, a questionnaire was enclosed in the back of all copies of the *Guide* and 807 responses were received. In 1986, an expanded version of the 1983 questionnaire was enclosed in the back of all copies of the *Guide* and 1337 responses were received. Questionnaires were enclosed in 100,000 of the 300,000 *Guides* in 1989, and 913 responses were received. In 1992, a total of 10,000 questionnaires, along with business reply envelopes, were sent to distributors, to be randomly inserted in the *Guides*. Since 494 replies were received from a greatly reduced sample size, this approach was considered to be successful. The same method was used in 1995 with 5000 questionnaires sent to distributors and a total of 260 replies received. This is a similar response rate to the 1992 questionnaire. In 1999, a similar approach using 10,000 questionnaires resulted in 424 replies received. For the 2003 questionnaire, 10,000 questionnaires and postage paid envelopes were distributed in a random sampling of *Guides*. The surveys were also available at the Spring Fishing Show and the Toronto Sportsmen's Show or by request. A total of approximately 11,050 surveys were distributed and 251 responses were received during 2003 and 2004. This response rate is low compared to previous Questionnaires.

The results of these questionnaires are used for several purposes. They provide information on the most effective means of distribution of the *Guide*, previous *Guide* use, the use and effectiveness of the consumption advice, fishing frequency, the most frequently fished locations and fish consumption patterns. As well, readers are given the opportunity to suggest additional sampling locations, to provide comments and to provide suggestions on ways to improve the *Guide*. Some of the practical suggestions from these questionnaires have been incorporated into the *Guide*.

The reports on previous questionnaire results have been published[2,3,4,5,6,7]. This report focuses on the results of the 2003 survey, with some comparisons to past surveys. A copy of the 2003 questionnaire is included in Appendix I.

3.0 QUESTIONNAIRE RESULTS

See Appendix II for descriptions and notes on some of the following calculations.

3.1 Background of the Respondents

Over 99% of the respondents were Ontario residents and over 89% of those residents were from Southern Ontario (Table 1). A similar distribution was found in the 1999 survey results. In 1999, 1.4% of the respondents resided in the U.S.A., while no 2003 respondents resided outside of Canada.

Table 1. Residence of Respondents

Residence	% of Respondents	
	1999	2003
Southern Ontario	85.4	89.5
Northern Ontario	13.0	10.1
Another Province	0.2	0.4
U.S.A.	1.4	-

The percentage of males and females responding to these surveys has been very consistent, with approximately 93% male and 7% female respondents in the 1992, 1995 & 1999 surveys (Table 2). In 2003, the percentage of male respondents declined to 88% and the female respondents increased to 12%.

Table 2. Gender of Respondents

Gender	% of Respondents			
	1992	1995	1999	2003
Male	93.1	93.0	92.9	88.0
Female	6.9	7.0	7.1	12.0

Almost half of the respondents were in the over 45 years age group (Table 3) whereas the most frequently responding age group in all previous surveys was 26 to 45 years. In 2003, the 26 to 45 year age class was the second most frequent group to respond. There was also an increase in the proportion of younger respondents in this survey compared to the previous one.

Table 3. Age Groupings of Respondents

Age Group (Years)	% of Respondents	
	1999	2003
Under 15	1.0	4.4
15-25	5.4	8.8
26-45	48.1	39.2
Over 45	45.5	47.6

3.2 Fishing Patterns

3.2.1 Fishing Frequency

Almost 70% of the respondents indicated that they fished at least once every two weeks, with the most frequent response being "more than once a week". This response is similar to the results of previous surveys and demonstrates the popularity of fishing as a recreational activity. The per cent fishing frequency for each of the chosen categories is shown in Table 4 (See Appendix II for notes).

Table 4. Fishing Frequency	
Frequency	**% of Respondents**
daily	0.8
>once/week	30.6
once/week	18.4
2-3 times/month	19.6
once/month	2.9
several times/year	7.7
once/year	0.8
only on vacation	8.2
rarely	0.8
never	2.4
other	7.8

3.2.2 Fishing Locations

Respondents were given a list of the most popular lakes and rivers from previous surveys plus extra space to add locations that were not listed.

Table 5 lists the most commonly fished bodies of water for the 1999 and 2003 surveys in four categories:

- The most popular angling areas
- The Great Lakes
- The most popular inland lakes
- The most popular rivers

The three most frequently fished water bodies were Great Lakes, and, as in previous surveys, Lake Ontario was the most frequently fished and Georgian Bay was the next most frequently fished location (in the 2003 survey, Lake Huron and Georgian Bay were separated). In comparison to other surveys, the number of respondents that fished in Lake Ontario increased by almost 15%. Lake Erie was the third most popular fishing location. The popularity of the Credit River and Rice Lake was notably lower in this survey.

As in all previous surveys, Lake Simcoe was the most frequently fished inland lake, as over 21% of the respondents fished this lake. As well, the majority of the top ten inland lakes fished were from the Kawartha Lakes' chain in Southern Ontario.

In the 2003 survey, the Grand River was the most frequently fished river in the province. The Credit River, which had been the most popular river for the past two surveys, dropped to sixth place. The Ganaraska River also declined in popularity, while the Saugeen and Ottawa Rivers rose considerably. The Maitland and the St. Lawrence Rivers replaced the Trent and the Thames Rivers in the top ten list.

3.3 Fish Consumption Patterns

3.3.1 Sport Fish Consumption

The questionnaire results provide useful information on sport fish consumption patterns. Respondents were asked which sport fish species they caught and consumed. As in all of the previous surveys, walleye was the most frequently caught and consumed sport fish, with over 67% of the respondents consuming it. The continued popularity of certain species is shown in Table 6. Species such as smallmouth bass, yellow perch, northern pike and rainbow trout have been in the top six positions for the past three surveys. Brook trout reappear on the list after being replaced in the last survey by rainbow smelt, which did not make the top ten in 2003.

Respondents were asked how frequently they consumed fish caught by angling from Ontario waters. Figure 1 compares the results of this survey and the 1999 survey. The most common meal frequency in 1999 was once every two weeks (twice per month). In 2003, the most common frequency was several times per year (renamed from "once/4 months" in the 1999 survey).

Table 5. The Most Frequently Fished Lakes and Rivers in the 1999 and 2003 Surveys			
1999		2003	
Lake/River	% of Respondents	Lake/River	% of Respondents
Most Popular Angling Areas			
1. Lake Ontario	37.8	1. Lake Ontario	51.8
2. Lake Huron/Georgian Bay	28.8	2. Georgian Bay	42.9
3. Lake Erie	24.4	3. Lake Erie	29.4
4. Lake Simcoe	22.8	4. Lake Huron	25.3
5. Credit River	15.5	5. Lake Simcoe	21.5
6. Rice Lake	14.0	6. Grand River	18.5
7. Grand River	14.0	7. Niagara River	15.9
8. Niagara River	12.4	8. Saugeen River	11.3
9. Lake Nipissing	12.3	9. Ottawa River	11.3
10. Buckhorn Lake	11.4	10. St. Lawrence River	11.2
The Great Lakes			
1. Lake Ontario	37.8	1. Lake Ontario	51.8
2. Lake Huron/Georgian Bay	28.8	2. Georgian Bay	42.9
3. Lake Erie	24.4	3. Lake Erie	29.4
4. Lake Superior	4.4	4. Lake Huron	25.3
		5. Lake Superior	2.4
Most Popular Inland Lakes			
1. Lake Simcoe	22.8	1. Lake Simcoe	21.5
2. Rice Lake	14.0	2. Rice Lake	8.5
3. Lake Nipissing	12.3	3. Lake Scugog	7.9
4. Buckhorn Lake	11.4	4. Buckhorn Lake	7.3
5. Lake Scugog	10.9	5. Kawartha Lakes	7.3
6. Pigeon Lake	8.5	6. Lake Nipissing	6.2
7. Balsam Lake	8.5	7. Muskoka Lake	5.1
8. Stony Lake	7.3	8. Balsam Lake	4.5
9. Lake St. Clair	5.8	9. Pigeon Lake	4.0
10. Sturgeon Lake	5.3	10. Lake St. Clair	3.5
Most Popular Rivers			
1. Credit River	15.5	1. Grand River	18.5
2. Grand River	14.0	2. Niagara River	15.9
3. Niagara River	12.4	3. Saugeen River	11.3
4. Ganaraska River	10.6	4. Ottawa River	11.3
5. Nottawasaga River	10.4	5. St. Lawrence River	11.2
6. Trent River	10.1	6. Credit River	9.9
7. Saugeen River	8.8	7. Nottawasaga River	9.9
8. French River	8.8	8. French River	7.3
9. Thames River	7.0	9. Ganaraska River	7.3
10. Ottawa River	7.0	10. Maitland River	5.3

Lake Huron and Georgian Bay were separated in the 2003 survey.
Percentages do not add up to 100% because there were multiple responses to question 8.

Table 6. Most Frequently Consumed Sport Fish Species by 1999 and 2003 Respondents			
1999		2003	
Species	% of Respondents	Species	% of Respondents
1. Walleye	64.9	1. Walleye	67.2
2. Yellow Perch	45.0	2. Smallmouth Bass	56.4
3. Smallmouth Bass	41.7	3. Yellow Perch	46.8
4. Rainbow Trout	39.0	4. Largemouth Bass	43.2
5. Lake Trout	32.9	5. Northern Pike	39.2
6. Northern Pike	30.3	6. Rainbow Trout	38.0
7. Largemouth Bass	29.6	7. Lake Trout	31.2
8. Chinook Salmon	20.8	8. Chinook Salmon	21.2
9. Smelt	19.4	9. Brook Trout	20.8
10. Crappie	18.7	10. Black Crappie	17.6

Percentages do not add up to 100% because there were multiple responses to question 9.

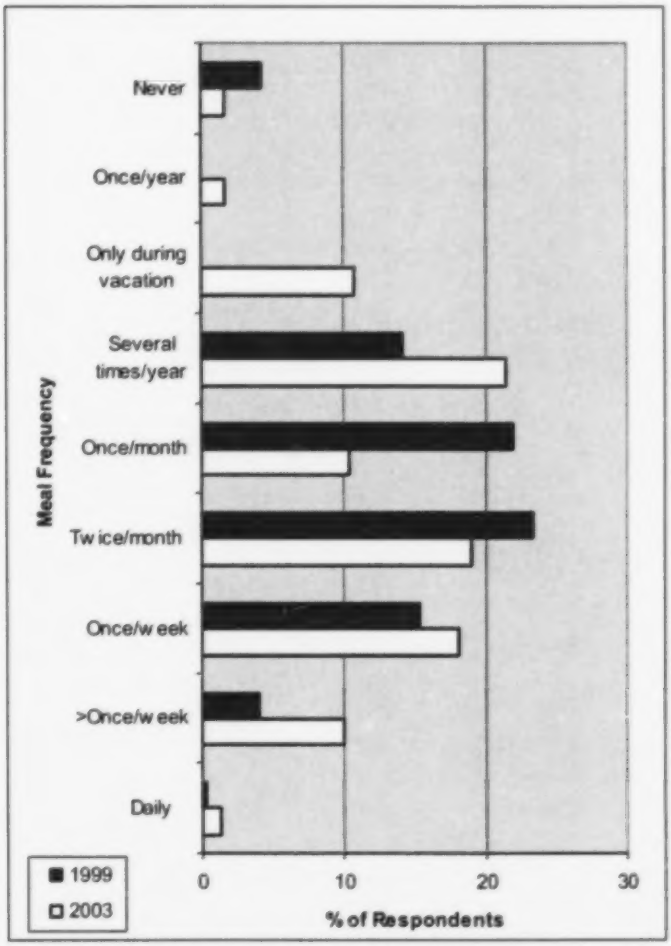

Figure 1. The frequency at which 1999 & 2003 respondents consumed sport fish meals.

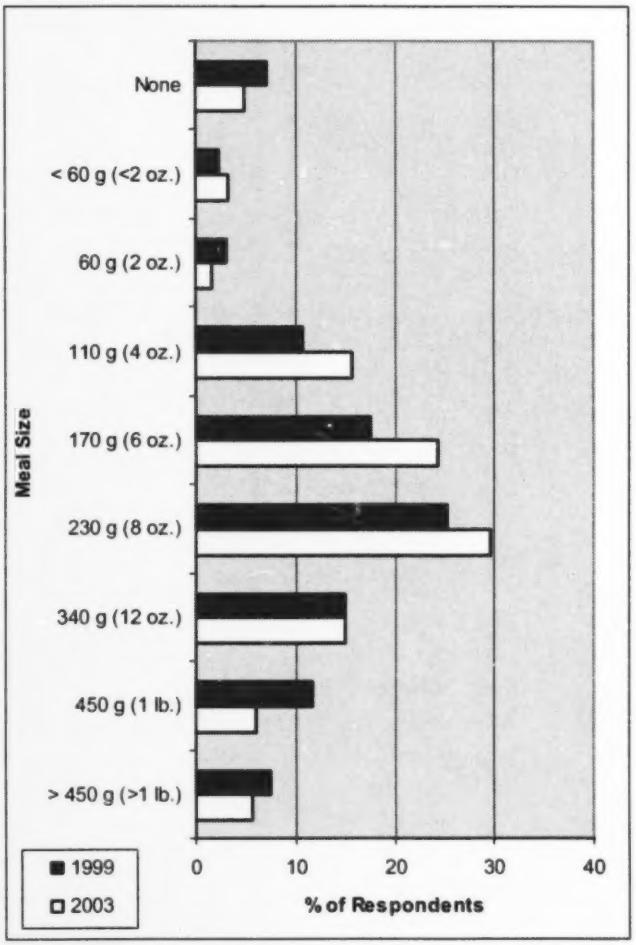

Figure 2. The size of sport fish meals that 1999 & 2003 respondents consumed.

The number of respondents that consumed sport fish at least once a month declined from 67.4% in 1999 to 58.7% in the 2003 survey. For this survey, only 1.7% of the anglers did not consume any sport fish, compared to 4.2% in the 1999 survey. Therefore, more people are consuming fish, just at a lower frequency.

The respondents were also asked to estimate the sport fish meal size they eat in a single serving. In the last three surveys, 8 ounces (approximately 230g) was the most common meal size eaten by respondents. Over half of the respondents consumed at least 8 ounces of sport fish in a single sitting (Figure 2). Due to the prevalence of this 8 ounce meal size in survey responses, it is used in the fish advisory calculations for the *Guide*.

From the responses to question 11, the average meal size was calculated to be 236 g (8.32oz) in the 2003 survey. This average was somewhat lower than those calculated for 1999, 267g (9.4 oz) and 1995, 256 g (9.0 oz). In 1995, the mean annual consumption was 18 meals per year. In 1999, sport fish consumption increased to an average of 23 meals per year. In 2003, it increased again to 39 meals per year. The average daily consumption of sport fish was estimated to be 17.0 g (0.60 oz) in the 1999 survey, and 24.9 g (0.88 oz) in 2003. Although the average meal size has decreased in the past survey years, the average number of meals consumed has increased. See Appendix II for a detailed description of the above calculations.

Respondents were asked if the skinless dorsal fillet was the only portion type they consumed (as recommended in the *Guide*). Over 47% of the respondents indicated that they only consume this portion. Of the 52.5% that consumed other portions, the majority (~61%) consumed the skinless full-side fillet portion. Table 7 shows the other portion types consumed by anglers. The second most frequently consumed portion was the "whole fish/fish steaks, with belly fat trimmed" portion. The portion which would be of the most concern due to the potentially higher contaminant content would be "fish eggs" and "fish organs". Fish eggs were only consumed by 4.5% of the respondents and fish organs were not consumed by any respondents. Over 8% of the respondents picked "other" which included walleye head meat and the tail.

Table 7. Consumption of Portion Types

Portion Type	% of Respondents
Skinless dorsal fillet	47.4
Skin-off, full-side fillet	31.9
Whole fish/fish steaks (belly fat trimmed)	12.0
Whole fish/fish steaks	11.2
Skin-on, full-side fillet	10.4
Other	4.4
Fish eggs	2.4

Percentages do not add up to 100% because there were multiple responses to question 13.

3.3.2 Consumption of Commercial Fish & Other Aquatic Species

In order to determine the consumption of commercial fish as well as sport fish, respondents were asked how often they ate fish purchased at a store, with the option to fill in the number of meals per month of ocean fish, freshwater fish and canned fish. Due to the lack of a "never" option for this question, it was assumed that if respondents did not check a specific option, they did not consume that type of commercial fish and it was counted in the "never" category. Figure 3 shows the per cent of respondents that consumed ocean, freshwater and canned commercial fish. For those respondents that did consume commercial fish, the average

was 2.4 meals per month of ocean fish (same as in 1999), 3.0 meals per month of canned fish and 0.8 meals per month of freshwater fish (a small decrease from 1999). The most frequent response was 1 to 4 meals per month of canned and ocean fish. This is equivalent to 29 meals per year of ocean fish, 37 meals per year of canned fish and 9 meals per year of freshwater fish consumed. In comparison, sport fish consumption in the 2003 survey was 39 meals per year. Most 2003 respondents (~66%) did not consume freshwater commercial fish. The average meal size for commercial fish was 211 g (7.4 oz), which is lower than the average sport fish meal size of 236 g (8.32 oz).

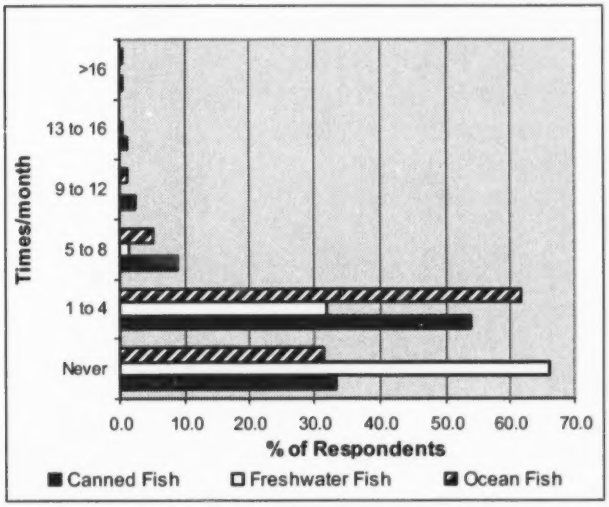

Figure 3. The frequency at which 2003 respondents consumed commercial fish meals.

Respondents were then asked to indicate which commercial fish species they consumed. They were given a list of species to choose from as well as an 'other' option with room to elaborate. The ten most frequently consumed commercial fish species for the 2003 survey are listed in Table 8. As in previous surveys, many of the top commercial fish species consumed were saltwater fish.

Table 8. The Ten Most Frequently Consumed Commercial Fish

Species	% of Respondents
1. Salmon*	64.3
2. Tuna (canned)	63.8
3. Halibut	44.7
4. Haddock	37.9
5. Cod	32.8
6. Rainbow Trout	31.5
7. Sole	28.9
8. Walleye	25.1
9. Ocean Perch	17.9
10. Yellow Perch/Smelt	14.9

*includes canned salmon

Due to concerns for sensitive consumers (ie. women of child-bearing age and children under 15) who may be consuming shark, swordfish or fresh or frozen tuna, which contain higher levels of mercury, an additional question was asked in this survey to determine the annual consumption of these fish. Only about 19% of the respondents consumed any of these, with shark being consumed by the most respondents. The average annual consumption of shark was 3.6 meals; swordfish, 3.3 meals; fresh tuna, 4.6 meals; and frozen tuna, 16.4 meals (see Appendix II for notes). The considerably higher percentage of frozen tuna meals is due to a small number of respondents reporting very frequent meals (e.g. 100 per year). The majority of respondents only consumed these species one to four times per year.

In order to assess the level of consumption of edible aquatic species other than sport fish, respondents were asked if they had ever consumed any of the following: freshwater clams/mussels, bullfrogs, snapping turtles or crayfish. Table 9 shows the percentage of the respondents that consumed any of these species one or more times.

Over 90% of the 2003 respondents had never consumed any of these other aquatic species, which is a considerable increase from past survey respondents, of which approximately 75% had not consumed them. Of the respondents that did consume these species, clams or mussels were the most frequently consumed species at 4.7%.

Table 9. Consumption of Other Aquatic Species	
Species	**% of Respondents**
Clams/Mussels	4.7
Bullfrogs	3.4
Crayfish	2.1
Snapping Turtles	0.0

3.4 Guide to Eating Ontario Sport Fish

3.4.1 *Guide* Awareness and Distribution Sources

In the questionnaire, respondents were asked how they first became aware of the *Guide*. Over 53% of the 2003 respondents indicated that they first became aware of the *Guide* after seeing it on display at a distributor (Table 10). A large portion of the respondents also became aware of the *Guide* through the advertisement in the Fishing Regulations or were informed of the *Guide* by a friend or relative.

Table 10. How Respondents First Became Aware of the *Guide*		
Source	**% of Respondents**	
	1999	**2003**
Saw it on display	47.7	53.8
Fishing Regulations article	23.5	13.3
Told by a friend/relative	10.6	12.4
Other	4.1	6.4
On the Internet	2.6	4.8
Newspaper, radio, or TV	4.6	4.4
Told by a gov't. official	4.5	4.4
Advertisement	2.4	0.4

Guides are distributed throughout the province mainly through the Beer Store and the Liquor Control Board of Ontario (LCBO) (almost 80%), MOE, MNR and other government offices and some fishing license distributors. Also, the *Guide* was launched at the Spring Fishing Show (Mississauga) in February 2003 and was distributed at the Toronto Sportsmen's Show in March of that same year. As shown in Table 11, over 22% of the respondents obtained their *Guides* from the display at the Fishing Show and over 20% obtained them from a government office (either through a direct mailing or an actual visit). The large proportion of respondents that obtained their *Guide* from the Spring Fishing Show is probably due to the non-random distribution of the questionnaires (the majority being distributed at the Spring Fishing Show). This does not reflect the actual distribution of the *Guide* since almost 80% of the *Guides* (~280,000) are distributed through the Beer Store and LCBO and less than 5% of the *Guides* (~10,000) are distributed at the Spring Fishing Show.

Table 11. Where Respondents Obtained the *Guide*	
Source	**% of Respondents**
Spring Fishing Show	22.4
LCBO Store	16.8
By mail from gov't office	15.2
Toronto Sportsmen's show	15.2
Beer Store	9.2
Internet	6.0
At a gov't office	5.2
From friend/relative	5.2
Other	4.8

The *Guide* has been available on the internet since 1999. This has proved to be a useful source as 50% of the 2003 respondents indicated that they would access the *Guide* in this way, up from 39% in the 1999 survey.

3.4.2 Use of the *Guide*

To determine *Guide* usage, respondents were asked whether they had obtained and used the *Guide* in previous years. Over 76% of the respondents had used previous editions of the *Guide*. Figure 4 shows the per cent of 2003 respondents who have used *Guides* from previous years (2001/2002, and/or 1999/2000, and/or prior to 1999).

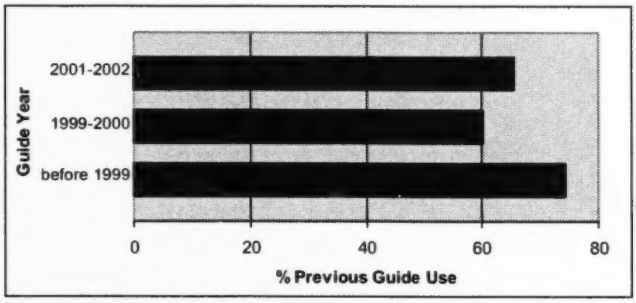

Figure 4. The portion of respondents that used previous editions of the *Guide*.
Percentages do not add up to 100% because there were multiple responses to question 6b. See notes in Appendix II.

3.4.3 Use of the Consumption Advice

In order to determine if users were following the advice in the *Guide*, the following questions were asked:
12 a) "If you intend to keep the fish that you catch, do you check the consumption advice in the *Guide*?"
b) "Do you follow the consumption advice in the *Guide*?"
c) "If you do not always follow the consumption advice in the *Guide*, why not?"

For question a), almost 80% of the respondents indicated that they do check their catch prior to consumption. The other 20% of respondents may only fish at locations where there are no restrictions on the species for which they are fishing, therefore there is no need to check the *Guide* each time they angle there.

For question b), four frequencies were offered: "always", "usually", "sometimes" or "never". Of the respondents, 41.2% replied that they always followed the consumption advice, while 37.4% replied "usually", 16.0% replied "sometimes" and only 5.8% replied "never". For those respondents who do not always follow the consumption advice, their reasons are listed in Table 12.

Table 12. Reasons for not Following Consumption Advice

Reason	% of Respondents
Don't catch or eat enough fish	49.6
Other	22.2
Areas fished not in *Guide*	20.7
Advice not strict enough	4.4
Don't eat fish	4.4
Consumption advice too strict	3.7

Percentages do not add up to 100% because there were multiple responses to question 12c.

Most of these respondents do not catch or eat enough fish to make use of the consumption advisories. Over 20% of respondents chose the 'other' category. Some of the more popular 'other' reasons were that the species was not listed in the *Guide*, the species was too small or a borderline size, or that they did not have a *Guide* to refer to.

3.4.4 Changes in Fishing and Fish-Consuming Habits

In order to determine the effectiveness of the *Guide* in influencing anglers' fishing habits, respondents were asked if the information in the *Guide* led to changes in their fishing and/or fish consuming habits.

Information in the *Guide* has influenced the majority of the respondents fishing and fish consumption habits. In the 2003 survey 66.5% indicated a change in habits after using the *Guide*. This is a substantial

reduction from the 1999 survey, where 93% of respondents reported a change, and the 1995 survey, where 72.9% reported a change. Over 81% of the respondents that indicated that their habits had changed, chose the response "awareness of contaminants in fish" as the reason for the change. Awareness of contaminants could influence both their choice of fishing locations (ie. they may start fishing in areas with few or no consumption restrictions) and their fish consumption habits (ie. they no longer consume all fish caught, but check the *Guide* before consuming fish). Other important changes in fish consuming habits include eating fish within the guidelines, returning larger fish, and changing fishing locations. Table 13 gives the frequency of the various responses. About 33% of the respondents indicated that the *Guide* did not change their fishing habits.

The results above indicate that the *Guide* was useful in making the public more aware of the presence of contaminants in sport fish and has led to changes in their consumption patterns.

Table 13. Positive Changes in Fishing and/or Fish Consumption Habits

Change	% of Respondents
Awareness of contaminants in fish	81.1
Eat fish within guidelines	45.7
Return larger fish	39.0
Changed fishing locations	19.5
Eat less fish	17.1
Eat more fish	7.9
Other	1.8
Stopped eating fish	0.6

Percentages do not add up to 100% because there were multiple responses to question 14.

3.4.5 Suitability of the *Guide*

Almost 85% of the respondents felt that the *Guide* met their needs. For those that did not feel their needs were met, the reasons were mostly that the lakes/rivers they fished or the species they targeted were not listed in the *Guide*.

It can be concluded that the *Guide* is a practical information source for anglers and sport fish consumers since 80% of the respondents checked the consumption restrictions prior to eating their catch and felt that the *Guide* met their needs overall.

3.4.6 Comments

Guide questionnaires provide the respondents with the opportunity to make suggestions for improvements to the *Guide*, additional lakes and rivers to be sampled and to provide comments on any aspect of the Program.

Over 22% of the respondents made suggestions for additional locations that should be tested. Some of the suggested locations had already been tested and some were not specific enough to determine the exact location. The remaining locations have been incorporated into the SFCMP's sampling schedule and will be tested if time and resources permit.

A large number of suggestions were received in the comment section at the end of the survey. Frequent suggestions included testing more species and locations, and combining the *Guide* with the Recreational Fishing Regulations Summary. Each of these suggestions is discussed in the following paragraphs.

An explanation of the reasons for selecting a particular location for sampling is given in the *Guide* introductory text. These reasons may include:

- it is a popular angling area
- there is a known or suspected source of pollution nearby

- it is a major source of food for local inhabitants
- it is being opened for recreational development
- it is part of a long-term monitoring study of contaminants in fish

The selection of testing sites is an ongoing process and public input is appreciated from sources such as questionnaire responses.

It is neither economically feasible nor necessary to test all fish species in a particular body of water. An explanation of the species selected for testing is given in the *Guide* introductory text. It is important to note that not all species accumulate a particular contaminant at the same rate. For example, top predators such as walleye and northern pike accumulate mercury to much higher levels than do pan fish, which feed lower down on the food chain. If low levels of mercury are found in the top predators, then testing of other species lower on the food chain is usually not necessary.

Every effort is made during any retesting to collect any top predator species which were not obtained in the initial testing of a location. Collection of certain species is sometimes difficult (e.g. deep water fish) and limits the ability to provide advisories for those species.

It would be difficult to combine the Recreational Fishing Regulations Summary with the *Guide* as each is formatted for its specific needs. For example, the fishing regulations booklet has maps which need a large paper size, while the *Guide* format is smaller with a different table orientation. As well, this would result in a very lengthy publication which may not appeal to all anglers.

The vast majority of the comments received were very favourable toward the *Guide* and the SFCMP. Some examples of the comments received were:

"The guide is great. I also use the guide to discover what species inhabit which lake (handy when planning a trip)."

"The book is great, I always take one with me when traveling & keep it in my boat."

"This guide is very helpful and easily understood."

"I like the guide the way it is right now. Keep up the good work."

"I am counting on this guide to inform me and my family about contaminant levels in fish, to make sure that we eat only the safest fish. This guide is a must to those who enjoy eating Ontario fish. Good work!!"

"The Ministry does an amazing job! I have witnessed their work first hand and am very impressed!"

"Set-up a simple rating system to show how lakes improve/worsen from year to year testing. Show of species in the lake and whether the samples have improved or worsened."

These comments serve to further reaffirm that the *Guide* publication serves a very worthwhile purpose as a source of useful information to the angling and fish-consuming public. The wide variety of comments received are included verbatim (with no spelling or grammatical corrections) in Appendix III.

4.0 CONCLUSION

The response to the 2003 survey was very low, about 2%. In past years, a larger response was observed (1999 - 4%; 1992 & 1995 – 5%). This low response results in a lower sample size and may compromise the accuracy of the statistical analysis. Investigation into ways in which to increase

the rate of response of the questionnaire is underway.

In this survey, there were higher proportions of female and younger respondents than in previous surveys. This difference may reflect an increased effort to reach these two target groups. The age grouping of the majority of the respondents shifted from the 26 to 45 age class in all previous surveys, to the over 45 age class. This shift in age is unusual and may simply be an anomaly associated with the distribution of the questionnaires. However, it could mark a shift in age and gender of users of the *Guide*.

Of the 2003 respondents, 70% go fishing at least once every two weeks. This is a similar proportion as in past surveys. Lake Ontario remains the most popular fishing location, increasing in popularity by 15% from last survey. And walleye continues to be the most popular caught and consumed sport fish.

The results of the 2003 survey show that more people are consuming fish at a lower frequency (several times per year instead of twice a month as in 1999). Due to the increase in numbers of fish consumers, the average number of meals per year increased from 23 in 1999 to 39 in 2003. However, the size of those fish meals has decreased slightly.

Respondents consumed more sport fish per year than any one category of commercial fish (ocean fish, canned fish, or freshwater fish). This most likely does not represent the general population because the Guide and the survey are directed at anglers and their families. In most cases, those who go sport fishing, are more likely to eat their catch instead of store-bought commercial fish.

The responses to this and previous *Guide* questionnaires, along with the comments, indicate that the *Guide to Eating Ontario Sport Fish* is widely used and appreciated by many Ontario anglers and sport fish consumers. There is a definite need to continue serving the Ontario public in the future with this useful information. Also, the questionnaire is useful as a means of obtaining public feedback which assists in the operation of the Sport Fish Contaminant Monitoring Program and allows for continual improvements to the *Guide*.

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APPENDICES

I 2003 Questionnaire

II Calculations Used for Sport Fish Consumption Figures

III 2003 Questionnaire Comments from Respondents

Appendix I

"Guide to Eating Ontario Sport Fish" 2003 Questionnaire

The Ministry of the Environment Sport Fish Contaminant Monitoring Program would appreciate your co-operation in completing and returning this postage-free questionnaire. Please answer as many questions as possible.

Your answers and comments will enable us to improve the *Guide* and the effectiveness of the program.

1. **What is your age?**
   ( ) Under 15 years
   ( ) 15-25 years
   ( ) 26-45 years
   ( ) Over 45 years

2. **What is your sex?**
   ( ) Male ( ) Female

3. **Where do you reside?**
   ( ) Northern Ontario
   ( ) Southern Ontario
   ( ) Another province
   ( ) The U.S.
   ( ) Other: .....

4. **Where did you obtain your 2003 guide?**
   ( ) Fishing Show
   ( ) Sportsmen's Show
   ( ) LCBO Store
   ( ) The Beer Store
   ( ) By mail from a government office
   ( ) At a government office
   ( ) From a friend or relative
   ( ) Internet
   ( ) Other: .....

5. **How did you first become aware of the guide?**
   ( ) Saw it on display
   ( ) Newspaper, radio or TV story
   ( ) Advertisement
   ( ) Told by friend or relative
   ( ) Told by a government official
   ( ) Internet
   ( ) Article in Fishing Regulations Summary
   ( ) Other: .....

6. **Have you used the guide in previous years?**
   ( ) Yes ( ) No

   If yes, which issue(s) of the guide have you used?
   ( ) 2001-02 ( ) 1999-2000
   ( ) before 1999

7. **How often do you go fishing in Ontario?**
   ( ) Only during a vacation: .... times
   ( ) .... times/week
   ( ) .... times/month
   ( ) .... times/year
   ( ) Never
   ( ) Other: .....

8. **What lakes and rivers in Ontario do you usually fish?**
   a) Great Lakes and Interconnecting Channels:
   ( ) Lake Superior
   ( ) St. Marys River
   ( ) North Channel
   ( ) Lake Huron
   ( ) Georgian Bay
   ( ) St. Clair River
   ( ) Lake St. Clair
   ( ) Detroit River
   ( ) Lake Erie
   ( ) Niagara River
   ( ) Lake Ontario
   ( ) St. Lawrence River

   b) Inland Lakes:
   .....
   .....

   c) Rivers:
   .....
   .....

9. **What species of sport fish do you regularly eat?**
   ( ) Black Crappie
   ( ) Brook trout
   ( ) Brown bullhead
   ( ) Brown trout
   ( ) Carp
   ( ) Channel Catfish
   ( ) Chinook salmon
   ( ) Cisco (herring)
   ( ) Coho salmon
   ( ) Lake trout
   ( ) Largemouth bass
   ( ) Muskie
   ( ) Northern pike
   ( ) Pink salmon
   ( ) Rainbow smelt
   ( ) Rainbow trout
   ( ) Rock bass
   ( ) Smallmouth bass
   ( ) Splake
   ( ) Sunfish
   ( ) Walleye (pickerel)
   ( ) Whitefish
   ( ) White sucker
   ( ) Yellow perch
   ( ) Others: .....
   ( ) do not keep fish to eat

10. **How often do you eat sport fish?**
    ( ) Only during a vacation: .... times
    ( ) Daily
    ( ) .... times/week
    ( ) .... times/month
    ( ) .... times/year
    ( ) Never
    ( ) Other: .....

11. **How much fish caught by angling from Ontario waters do you eat at a single meal?**
    ( ) None
    ( ) Under 60 g (2 oz)
    ( ) 60 g (2 oz)
    ( ) 110 g (4 oz)
    ( ) 170 g (6 oz)
    ( ) 230 g (8 oz)
    ( ) 340 g (12 oz)
    ( ) 450 g (1 lb)
    ( ) Over 450 g (1 lb)

12. **a) If you intend to keep the fish that you catch do you check the consumption advice in the guide?**
    ( ) Yes ( ) No

    b) Do you follow the consumption advice in the guide?
    ( ) Always
    ( ) Usually
    ( ) Sometimes
    ( ) Never

c) If you do not always follow the consumption advice in the guide, why not?
( ) Don't eat fish
( ) Don't catch or eat enough fish
( ) The consumption advice is too strict
( ) The consumption advice is not strict enough
( ) Areas fished are not listed in the guide
( ) Other: .....

13. The consumption advice in the guide is based on the skinless dorsal fillet. Is this the only portion of the fish that you regularly consume?
( ) Yes ( ) No

If "No", which other portion(s) do you regularly consume?
( ) Skin-on, full-side fillet
( ) Skin-off, full-side fillet
( ) Whole fish/fish steaks
( ) Whole fish/fish steaks, with belly fat trimmed
( ) Fish eggs
( ) Fish organs: .....
( ) Other: .....

14. Has the information in the guide led to a change in your fishing and/or fish-consuming habits?
( ) Yes ( ) No

If "Yes", in what way(s)?
( ) Awareness of contaminants in fish
( ) Eat more fish
( ) Eat less fish
( ) Eat fish within guidelines
( ) Return larger fish
( ) Stopped eating fish
( ) Changed fishing locations
( ) Other: .....

15. a) Does the information provided in this guide meet your needs?
( ) Yes ( ) No

b) If no, why not?
.....
.....

c) Could you suggest additional lakes and rivers to be tested?
.....
.....
.....

16. a) How often do you eat fish purchased at a store?
( ) Ocean fish: ... times per month
( ) Freshwater fish: ... times per month
( ) Canned fish: ....times per month

b) Which species of fish would you normally purchase?

Ocean fish
( ) Boston bluefish
( ) Cod
( ) Haddock
( ) Halibut
( ) Ocean perch
( ) Salmon
( ) Shark
( ) Sole
( ) Swordfish
( ) Tuna (canned)
( ) Tuna (fresh or frozen)
( ) Turbot
( ) Other: .....

Freshwater fish
( ) Catfish
( ) Lake trout
( ) Rainbow trout
( ) Smelt
( ) Walleye
( ) Whitefish
( ) Yellow perch
( ) Other: .....

c) If you consume shark, swordfish or fresh or frozen tuna (not canned), please indicate how frequently.
( ) shark: ... times/year
( ) swordfish: ... times/year
( ) fresh tuna: ....times/year
( ) frozen tuna: .... times/year

17. How much fish purchased from a store do you eat at a single meal?
( ) None
( ) Under 60 g (2 oz)
( ) 60 g (2 oz)
( ) 110 g (4 oz)
( ) 170 g (6 oz)
( ) 230 g (8 oz)
( ) 340 g (12 oz)
( ) 450 g (1 lb)
( ) Over 450 g (1 lb)

18. Please indicate which of the following you may have consumed from Ontario waterbodies and at what frequency:
( ) Freshwater clams/mussels .... times/year
( ) Bullfrogs .... times/year
( ) Snapping turtles ... times/year
( ) Crayfish ... times/year
( ) No, I have never consumed any of these

19. The guide is available on the Internet. Will you use this information source?
( ) Yes ( ) No

Any comments on this guide or suggestions for improvement (including additional information you would like to see in the guide) would be appreciated.

.....
.....
.....
.....

Thank you for taking the time to assist us.

For a copy of the results of previous questionnaires or if you have any questions or concerns, please contact the program at (toll-free) 1-800-820-2716, in the Toronto area at (416) 327-6816 or by e-mail at sportfish@cnc.gov.on.ca

Pour obtenir une version en français du questionnaire, appelez-nous à l'un des numéros indiqués ci-dessus.

APPENDIX II

Calculations used for Sport Fish Consumption Figures

Due to the fact that some people did not respond to all of the questions in the survey, it was decided that the percentages would be calculated using the total number of responses to the specific question. A total of 251 surveys were returned, so the sample size was determined by subtracting the number of blanks (non answers) from the 251 total. When more than one answer was permitted for a specific question, the sample size was calculated in this way. However, in this case, the percentages will not add up to 100%.

The following methods were used to calculate the sport fish consumption figures used in this report:

a) Mean Meal Size

The mean meal size was calculated from responses to question 11 in the questionnaire, which asked:" How much fish caught by angling from Ontario waters do you eat in a single meal?" The calculations were initially done in ounces, and for the "under 2 oz (60 g)" response, a value of one ounce was assumed. Also for the "over 1 lb (450 g)" response, 20 ounces was assumed. The number of responses for each size category was determined and the results were totaled. The number of respondents who did not consume any sport fish were deleted from the calculations. The total was divided by the number of fish-consuming respondents to derive an average meal size of 9.4 oz or 267 grams.

b) Number of Sport Fish Meals Consumed/Year

The number of sport fish meals consumed/year was determined from the responses to question 10, which asked "How often do you eat sport fish?". All the responses were converted to a number of days out of the year (eg. "daily" = 365, "once /week" = 52, etc.). For the "more than once per week" response, three times/week (156) was assumed, and numbers were used, as given, in the "only during a vacation:__times"* and "other" categories. For those responses that gave a frequency between 2 and 11 meals per year, an average frequency of 5 meals per year was used. The number of responses for each category, multiplied by the equivalent number of days, was totaled and divided by the number of respondents who consumed sport fish. This gave an average figure of 23.3 meals/consumer/year.

*Only 16 of the 26 who answered "only on vacation" also gave a frequency (# of times). To do the above calculation, the total number of times or meals (of those who entered a frequency) was counted and this was used as the number of meals per year for that category. Those who did not enter a frequency could not be counted. This may skew the resulting meals per year calculation.

c) Daily Sport Fish Consumption Figures

This figure is derived from the following calculations:

number of meals/consumer/year (23.3) X mean meal size (9.4) = number of ounces consumed/year (219)
This result was converted to grams/year (multiplying by the conversion factor of 28.35), and was divided by 365 days to give a daily sport fish consumption figure of 17.0 grams.
Commercial fish consumption was calculated a bit differently. Due to the fact that the frequencies were all per month, the total meals per month were simply counted and divided by the total responses minus blanks and "nevers"*. That average meal/month value was then multiplied by 12 to determine the average annual meal consumption.

*As stated in the report, there was a lack of a "never" option in question #16. The assumption that those respondents that did not check an option belonged in the "never" category may have weighted the results.

Notes:

Question #6: Have you used the *guide* in previous years?
If yes, which issue(s) of the guide have you used?
If the response was 'no' to the first part of the question but there was a response to the second part, the answer to the first part was changed to 'yes' and the percentages were then calculated.

Question #7: How often do you go fishing in Ontario?
Some respondents qualified response with "during fishing season", however, the frequency they provided was only used. Some frequencies were rounded to fit into these categories.

Question #16b. Which species of fish would you normally purchase?
c. If you consume shark, swordfish or fresh or frozen tuna (not canned), please indicate how frequently.
To determine the overall percentage of people consuming shark, swordfish or tuna (fresh/frozen), the number of responses to question b was used. However, to determine the average annual consumption, the number of responses from question c was used.

APPENDIX III

2003 Questionnaire Comments from Respondents

The following are verbatim comments received in reply to the questionnaire statement: "Any comments on this guide or suggestions for improvement (including additional information you would like to see in the guide) would be appreciated". Please note that these comments were not corrected for grammatical or spelling errors.

1. Thanks for your guide.
2. Expand the guide to more bodies of water.
3. Keep up the good work!
4. I have not ever been sick because of eating fish. I have fished for 48 yeas in St. Lawerence River and area lakes. I don't know why the Lake Trout taste real fishy any more? Lake Trout in Charlston Lake have changed flavor also.
5. Excellent waste of taxpayer's money! Suggestion for improvement, cease publishing guide. I talked to hundreds of people who are aware of guide but do not refer to it!
6. Cancel fishing tournament & festivals! To hell with the money! We're killing the fish population! Protect the environment.
7. The use of lead. Do you use? Y or N? Barbless hooks. Do you use? Yor N?
8. Maybe a small section on recipes, fishing techniques in specific areas, information on releasing fish - survival rates etc.
9. Some large lakes (ie Big Gull Lake) only have one type of fish marked. That is not very helpful.
10. Personally I think the guide for eating the fish caught should come when fishing license is issued to the angler. In my opinion is the best way for getting the information of the guide.
11. More durable pages.
12. Measurements the government is taking to clean up these lakes.
13. I would like to see recipes and filleting instructions.
14. Colour pictures for fish identification.
15. I find the guide extremely valuable in addition to contaminant information, fish I.D., records etc. I would like to see more testing for a wider range of chemicals. Also record fish should not have to be killed to qualify.
16. It would be nice to show which companies are poluting our water & if any effort are made by them or if the government is making laws to stop it or improve it.
17. Thank you for providing this guide.
18. The guide is great. I also use the guide to discover what species inhabit which lake. (Handy when planning a trip).
19. The nature of the contaminents in each lake with use of symbols would be appreciated. *Too much to download to see anything.
20. The book is great, I always take one with me when traveling & keep it in my boat.
21. How to fillet step by step including proper "Y" bone removal of pike.
22. This guide is very helpful and easily understood.
23. I think the guide is great for everyone to read to there children.
24. List more Back wood lakes between Matawa to Cohden.
25. I like the guide the way it is right now. Keep up the good work.

26. Information on Horn Lake in Chapman TWP. Aditional information on Ling (Burbot) in Lake Bernard Strong TWP.
27. Combine guide with Regulations.
28. It would be nice to know what lakes were tested, by whom + what portion of the fish was tested. Tests should be done regularly.
29. Being a first year fisherman I found the guide really informative. The fish species illustrations were really cool. Now I know how to identify the fish when caught.
30. Twp's are difficult to locate. Use near towns eg. Algonquin Park, Guelph Lake in Guelph. Trust MNR more than MOEE.
31. Allow advertisement to offset cost to tax payers and eliminate or reduce angling license fees and or hire more game warden, more stocking, research, etc.
32. You should have some comparison for freshwater - saltwater fish consumption guidelines to better help ppl to have a comparison and context.
33. Very good guide.
34. I would suggest a consumption guide for a specific part of the province. This book would have to have more listings of lake and rivers in that region. Also all game fish should be listed in those lakes or rivers. For example a book strictly on Eastern Ontario or South Western Ontario would be more beneficial.
35. The guide was very usefull and contained much info.
36. I would like to see some information on Ocean or Sea run species of Trout ie: speckle trout from James Bay.
37. I am counting on this guide to inform me and my family about contaminent levels in fish, to make sure that we eat only the safest fish. This guide is a must to those who enjoy eating Ontario fish. Good work!!
38. How many people use this guide if purchasing cottage property.
39. Explain or illustrate what a dorsal fillet is.
40. I catch my fish + eat.
41. Thank you!
42. Consumption advice is only "advice".
43. I'm sure you get this a lot but I have caught fish in lakes listed that aren't tested. I never know how much to eat or if to eat at all.
44. Current state of each population of fish in each lake, are populations going up or down. Single out lakes that should be left unfished due to overfishing or poor fish populations. If the population is in danger they will be harder to catch anyways. There are hundreds of lakes to choose from so I would rather fish a healthy lake than an endangered one.
45. Put back more money into fisheries that you that you receive from fees, licences, etc, etc
46. I find it hard to use so I am not sure that I am using it correctly. None of the lakes I looked up were in it.
47. Photos of fish along with more info about other fish in water bodies that are ok to eat. Clear info on areas of fish that are safest to eat. *Most importantly, what is the Ministry doing to reclaim our fish + water safety. I was appalled to see the advisories in certain lakes - what a poor job we are doing in Ontario + how quickly we have destroyed the lakes - the government needs to take stronger action!
48. State all fish species in a lake. For example some lakes have many different species however this guide may not list all of them.

49. I am a year round angler license #[redacted] and I would like to see decline successes or increases in test results for my lake (Lake St. Clair) not just "Lake Superior" as shown in the 2003-2004 guide. P.S. Thank you, I have 2 young boys ages 9 & 2, and what more can I do to help!!!
50. Excellent service offered by MOE. Possible research to other toxins they may enter waterbody not currently tested for.
51. Many lakes mentioned in the guide seem to have a larger variety of species of fish than what is indicated in the guide. I mainly use the guide as a way of telling me what fish are in certain lakes.
52. People I have spoken to (fisherman, Env. Scientist, etc.) feel the guide is not strict enough with warnings and limits to eat, if edable at all.
53. How bad is the situation? What are the health consequences of eating cont. fish? These ques. May be answered in the guide but I have not looked at all of the pages.
54. I think you should do this questionnaire online as well.
55. I like every thing that you have done in the guide.
56. While the Guide does an excellent job (pp.13-14) in describing how to prepare and release fish, I am of the personal opinion that stronger language needs to be used to address: 1) Those who do not know how to fillet a fish. They make a mess of the fillet and toss a good eating portion of the fish away. Perhaps there should be more than one way described when it comes to cleaning fish. 2) While I have seen too many adults throw fish back into the water, children and teenagers are most often not taught how to handle fish in order to release them. Those who engage in the activity are generally catching fish too small to keep, and those are the one we need to make sure go back in the water safely. Perhaps a **Children's Section**, as a pull-out booklet, specifically designed to let them know: a) a review of fish that should not be caught before their seasons begin b) larger line drawings of most common fish caught c) how to get their fish off a hook if someone isn't around to help d) how to release e) when they need to get a license f) and perhaps even some tips about how to bait a hook. Afterall, I would imagine a large majority will continue to fish as they get older. We might try to teach them right now. Having said that, I would also like to thank you for your publication. My dad introduced me to it over 10 years ago, and I have passed on info about the publication to friends. I also kept a copy on my boat for reference if any 'visitor' new to the marina questioned the status of the fish being caught. My 3 brothers and I look forward to the publication every year.
57. Make them available at every bait shop or worm store
58. The guide could include fishing tips (eg. where to go for fishing) and fishing techniques to be used. At least it could publish the website address to get this information. It would be very helpful for new anglers. Thank you.
59. You are doing a good job.
60. Thanks for allowing some input. Any and all info available, if accurate, is most beneficial.
61. Larger print in all of the tables.
62. I have fished all my life and only recently started using the "free" guide. Thanks for the info.
63. Fish recipes.

64. Inform people of the danger that exists from using LEAD weights on line! (In book).
65. The Ministry does an amazing job! I have witnessed their work first hand and am very impressed!
66. Request to test # 15 c (Paugh Lake). It is large lake with lots of cottages.
67. Request to test # 15 b.c. (Lake Paugh) as indicated.
68. As a family, I generally set the pace for eating fresh fish or canned fish. We generally fish the same waters although our likes in fish differ.
69. It is hard to answer some of these questions on behalf of children who "seriously" fish and enjoy fish as a food. Perhaps there should be a page dedicated to children who eat fish on a regular basis?
70. My daughter wants to know if you can make fish without bones! Thank you for your efforts! Keep up the good work!
71. Our family carries on a catch and release program unless the fish is badly damaged. I only "fish" seriously during vacation and only keep a mid-sized fish, nothing too small or too large.
72. The tuna scare many years ago put me off tuna. I don't buy fresh, frozen or canned tuna, I will not feed it to my children and do not purchase it when our for a meal. Maybe there needs to be more info for consumers buying ocean fish to eat them know the kinds of contaminants and stores should be forced to post that information.
73. My mom and dad make us eat fish once a week or so. They also make us eat fresh fish when dad catches some.
74. Set-up a simple rating system to show how lakes improve/worsen from year to year testing. Show of species in the lake and whether the samples have improved or worsened.
75. I sometimes use internet source when exploring my opportunities in new locations to me. I always carry the guide in my tackle box & view before making a decision to keep fish for consumption.
76. I hope you will continue to send me the Guide, I really appreciate it, and use it often. I also lend it to some of my fishing Buddies.